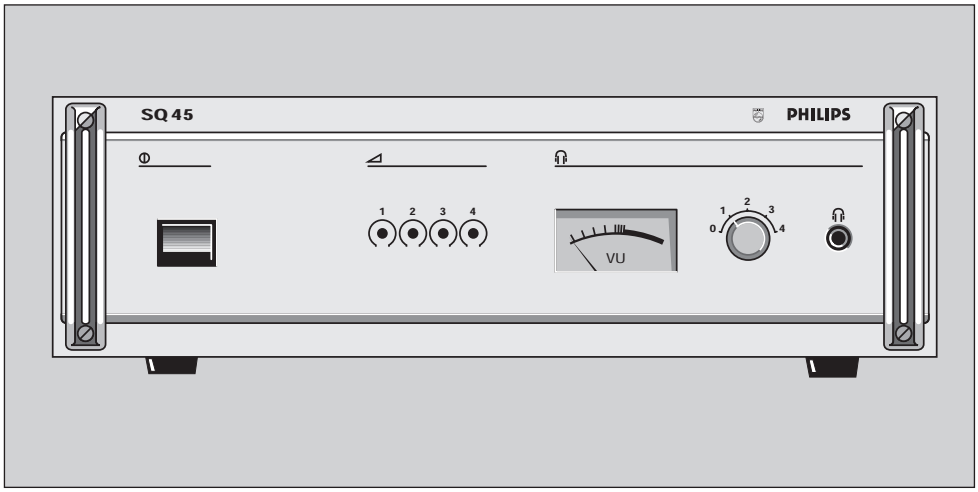
User Manual

SQ 45



High Performance Power Amplifier

LBB 1342, 1343, 1344, 1346, 1347, 1348

Philips
Communication &
Security Systems

PHILIPS

ENGLISH

Instructions for use page 1

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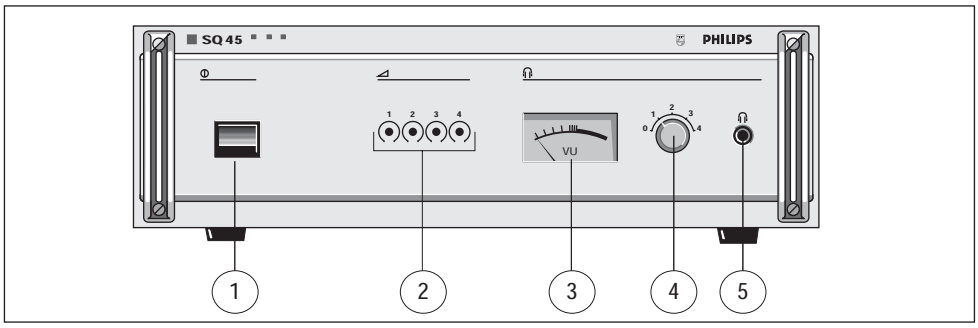


Fig. 1 - Front view

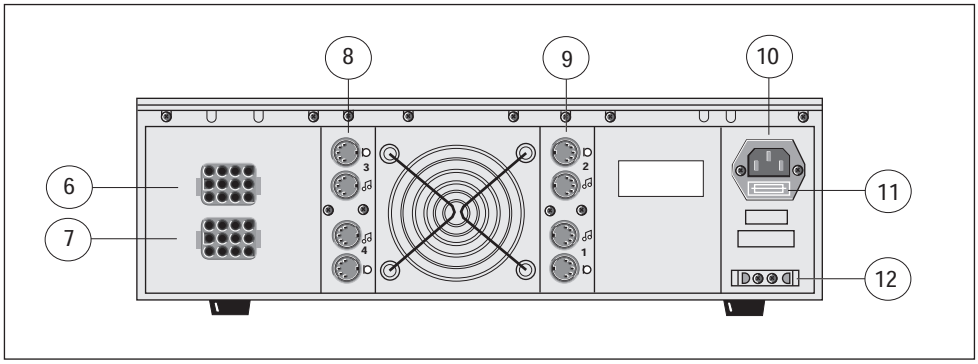


Fig. 2 - Rear view

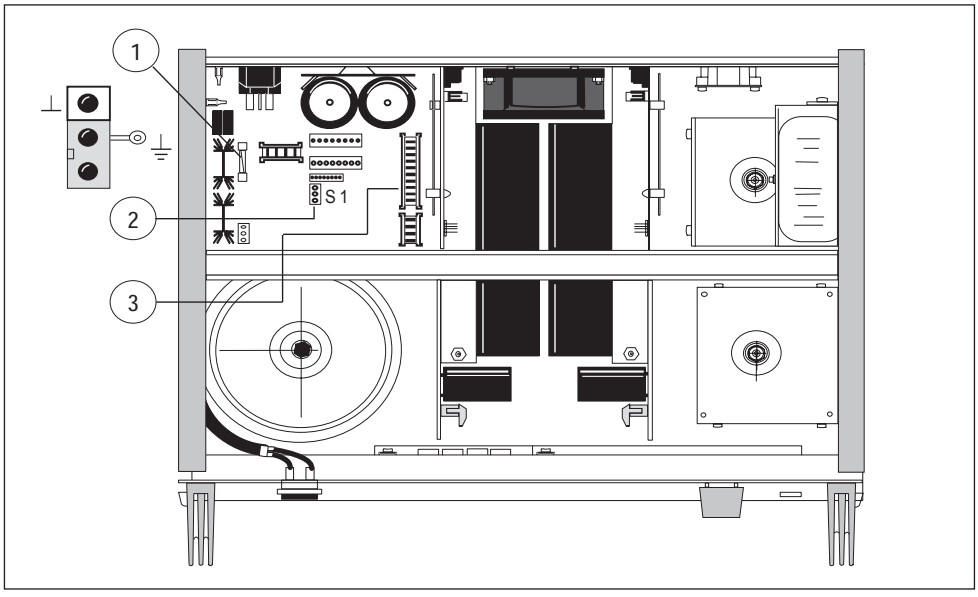


Fig. 3 - Top view

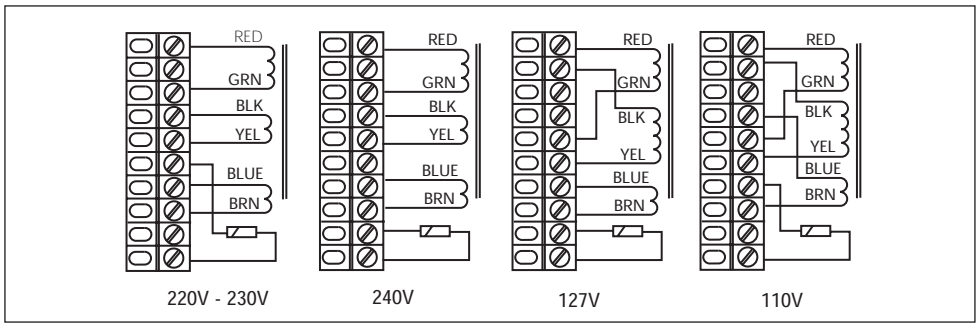


Fig. 4 - Mains connections

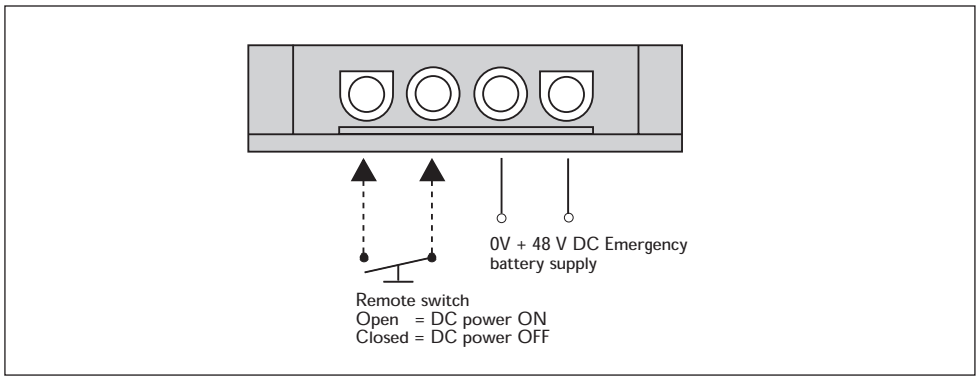


Fig. 5 - Battery supply

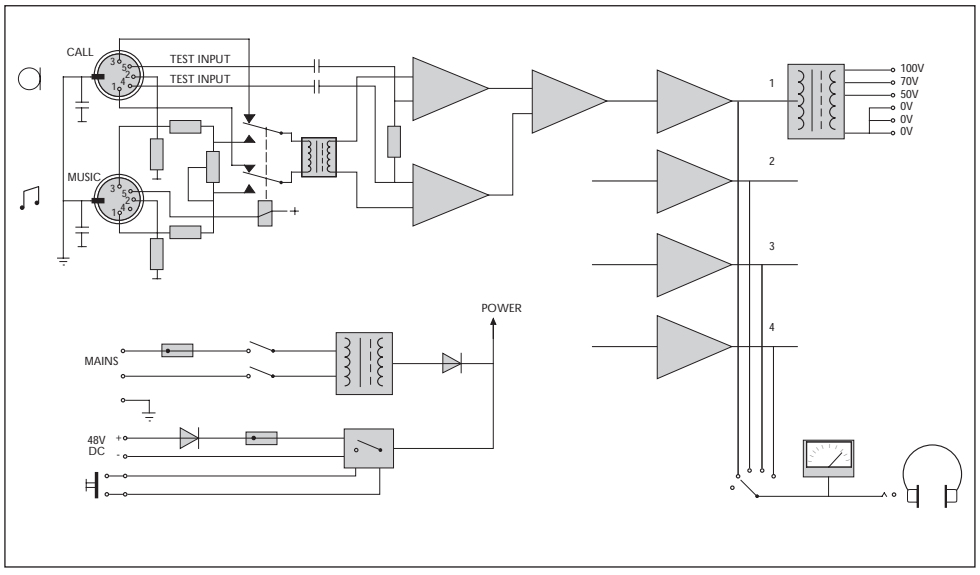


Fig. 6 - SQ45 Block diagram

ENGLISH

The following list gives the amplifier configurations (see fig.8) available in the Power Amplifiers series 100, 70 and 50 V output:

- LBB 1342/40 1 x 100 Watt
- LBB 1343/40 2 x 100 Watt
- LBB 1344/40 1 x 200 Watt
- LBB 1346/40 4 x 100 Watt
- LBB 1347/40 2 x 200 Watt
- LBB 1348/40 1 x 400 Watt

Illustrations are printed on the inside of the two-fold-out cover pages.

A mounting kit for table top version is available under type nr. LBB 1329/30

1 INTRODUCTION

The SQ 45 range of high performance audio power amplifiers have been designed for smooth operation in professional Public Address projects. Ease of installation, along with good service accessibility and reliability have been optimized in their design.

The mechanical housing for the range of SQ 45 amplifiers has been designed to accommodate up to a maximum of four individual amplifiers in a single housing, using a common power supply, therefore saving both cost and space.

Because of the SQ 45 mechanical housing, a number of configurations are available to suit a variety of application needs. The units can be easily mounted into 19" racks.

Each individual amplifier has two balanced audio inputs:

- 'music' input, with adjustable pre-set level control, for (continuous) back-ground music.
- 'priority' input with fixed input level for (occasional) paging and other calls.

The 'music' input is normally active until a call is made, at which time the in-built relay switches the amplifier to the 'priority' input, overriding the music signal, and its volume setting. When the call is finished the relay switches the amplifier back to the music input and the music signal resumes at its normal level. The change over from one input to the other can be controlled remotely.

An electronically balanced 'test' input is provided, into which an in- audible signal may be injected. This signal is sampled at the output to provide continuous

monitoring of correct amplifier functioning. Extra equipment must be used to sample the signal; e.g The Amplifier Surveillance Board (ASB) from the SM 40 range may be used.

The outputs may be tapped at three different voltages (100, 70 and 50 V) from the 100 V output transformer.

Alignment and monitoring are accomplished via a four position selector switch for monitoring individual amplifiers via the VU meter and headphones.

The unit is fitted with an emergency 48 V DC battery supply, which will automatically power the unit in the event of a mains failure, or if there is a significant drop in the mains supply.

2 INSTALLATION

2.1 Mains supply voltage

The unit as supplied is suitable for mains voltages of 220 - 230 V AC. For adaption to mains voltages of 110, 127 and 240 V, the required voltage has to be set accordingly. To change the voltage, unplug the long grey coloured screw connector from its connector block (fig. 3.3), and rewire it for the appropriate voltage (fig. 4). Push the connector block firmly back into its place. For mains voltages of 110 V and 127 V, the 4 amp (T) mains fuse built into the standard "Europlug" has to be replaced by one with a value of 8 amp (T) (see fig. 2 10 and 2.11). To remove the mains fuse, first remove the mains power lead from the socket at the rear of the unit. Carefully insert a medium sized screwdriver under the fuse cover's small lip (nearest the socket pins), and gently twist the screwdriver to lever the fuse holder out.

A self-restoring thermal cut-out operates on the primary winding of the mains transformer.

WARNING:
When due to excessive temperature, the thermal cut-out shuts down the amplifier although the full mains voltage will still be present inside the unit.

A suitable earthed AC mains distribution socket should be provided inside the 19" rack to provide power for the amplifiers. The unit is supplied with a 2.5 m long mains lead, terminated with a standard IEC two pole earthed mains plug. In some countries it will be necessary to replace this plug with one of a local standard type.

A replacement plug must be wired as follows:

earth - green/yellow
neutral - blue
live - brown

WARNING:
This apparatus must be earthed.

2.2 Emergency power supply 48 Volt

In situations where the mains power supply is unreliable an emergency 48 V battery supply may be used. This supply will automatically be switched in whenever the mains power fails. A Mate-N-Lok supply socket is provided to allow the 48 V DC battery supply to be connected (fig. 2.12). Details of the connector are shown in fig. 5 and should be wired accordingly. For use in special applications, a manual on-off switch can be connected enabling the 48 V DC power supply to be switched on and off as and when required.

The value of the 48 V DC fuse (fig. 3.1) is 10 amp.

2.3 Grounding and earth loops

On delivery the electrical and mechanical earths of the unit are interconnected. When two or more units are used in a system, it is necessary to ensure that earth loops are not introduced by earth wiring. In this case, the electrical earths of all units should be linked together via e.g. points 2 of DIN connector, then joined by one wire link to the mechanical earth on one unit only. To disconnect the electrical and mechanical earths, jumper S1 (fig. 3.2) must be positioned as shown or removed.

2.4 Input connections

Each of the amplifiers in the unit is provided with three inputs: 'priority', 'music' and 'test'. The connections for these inputs, and the wiring for the remotely controlled selection between the 'priority' and the 'music' input, is made via two, 5-pole 180° DIN-type sockets per amplifier.

The pins of the corresponding plugs (fig. 6) are to be connected as described next:

2.5 Music input (fig. 6)

pin 1 - music signal, live
pin 2 - music signal, screen
pin 3 - music signal, live (return)
pin 4 - not connected
Pin 5 - input selection*

* To allow remote control of input signal selection:
Music input - pins 2 & 5 linked (relay activated)
Priority input - pins 2 & 5 open

2.6 Priority and Test input (fig. 6)

pin 1 - call signal, live
pin 2 - call signal, screen
pin 3 - call signal, live (return)
pin 4 - test signal, live
pin 5 - test signal, live (return)

The 'test' input (pins 4 and 5) is active under both conditions.

NOTE:
The 'test' input is provided for ultimate use with the SM 40 microcomputer controlled surveillance system.

2.7 Input sensitivity adjustment

The 'priority' input sensitivity is optimised for use with the SM 40 or SM 30 system, and pre-set at 1 V on delivery. Improving the sensitivity to 0.5 V is simply a matter of removing 1 or up to 4 jumpers S3 (S103) located on the printed circuit board(s) of the amplifier. The number of jumpers to be removed depends on the configuration of the amplifer. For location details of the jumpers refer to Service Information code no. 4822 861 05034.

The 'music' input sensitivity is adjustable between 0.5 and 10 V to cope with output levels from external or domestic music sources, e.g. CD player, radio tuner, and cassette player etc.

2.8 Parallel connection of inputs

The pre-amplifier output of, for example, a mixing amplifier, may be connected to the input of this amplifier, and to the inputs of several other power amplifiers. Public Address systems of practically any wattage can be built by using this method of connection.

2.9 Loudspeaker connections

On delivery the amplifier is supplied with a small plastic bag containing two 12-pole Mate-N-Lok blocks, complete with contact pin ejector tool (fig. 10). When fitting the contact pins to the external wiring, they may be either soldered or crimped.

Also included in this bag are three small plastic inserts used to cap any redundant holes left by the sensitivity controls at the front of the amplifier.

Mate-N-Lok sockets are mounted on the rear panel, (fig. 2). These are provided with corresponding plugs, and serve primarily as transformer output connections to a variety of loudspeakers. Socket X5 (fig. 2.6) is for outputs of amplifiers 2 and 3. Socket X6 (fig. 2.7) is used for the outputs of amplifiers 1 and 4.

2.10 Loudspeakers for 100, 70 or 50V systems

Loudspeakers with suitable matching transformers can be connected in parallel with the 100, 70 or 50 V outputs so long as the total power does not exceed the nominal output power rating of the amplifier.
The maximum cable length from the amplifier to the loudspeakers can also be determined by the amplifier output's maximal load capacitance (see technical data).
100 V loudspeakers connected to the 100 V output will consume their nominal power. If, however,100 V loudspeakers are connected to the 70 V output, then the loudspeakers power consumption will be equal to one half of their nominal rated power. This means that twice as many loudspeakers can be connected without overloading the amplifier. Similarly, if 100 V loudspeakers are connected to the 50 V output they will only consume a quarter of their nominal power, and an increase of up to four times as many loudspeakers is possible.

2.11 In-phase connection of loudspeakers

Disturbing effects can occur, particularly when loudspeakers are mounted close together, which are caused by the loudspeakers being connected in anti-phase. To ensure an in-phase connection in 100 V

systems, all similar loudspeaker terminals (in most cases one terminal is marked with a red dot) must be connected to the same wire on the distribution cable.

2.12 Mounting the unit into a 19" rack

WARNING:
For safety reasons this unit may only be mounted in a 19" rack with lockable top and bottom covers, side panels, and rear door(s), which can only be opened by skilled technicians, and should be fitted so that mains terminals and all live parts are not accessible from outside the rack.

The unit may be mounted into a rack by means of four bolts with washers, via slots in the front panel. No further mechanical support is necessary.

The units should be mounted with 1HE spacing panels (fig. 11) and rack forced cooling should be considered, especially when the units are used continuously at full power with music and speech (call) at an ambient temperature of 55°C max. (acc. IEC 65).

Mounted in a (19") cabinet, the temperature inside the cabinet will be valid as ambient temperature for the amplifier. Exceeding this temperature can cause a decrease in the amplifiers expected life-time. Depending on the installed power in a cabinet, a number of precautions are advised . (Refer also to fig. 11).

3 CONTROLS (see fig. 1)

1 Mains on/off switch.
2 Sensitivity control pre-set for ch-1, ch-2, ch-3 and ch-4 'music' inputs only.
3 Output leven VU-meter plus illuminated scale (mains on).
4 Four position selector switch for monitoring individual amplifier channels via the VU-meter and headphones.
5 Headphones socket (6.3 mm standard jack socket).

Technical Data

SUPPLY

Mains supply

- voltage : 110 - 127 - 220/230 - 240 Volt at 50/60 Hz
- inrush current limiter : 30 A

Emergency battery supply

- voltage : +48 V (polarity protected with ref. to ground)
- inrush current limiter : 1 A

Power consumption (max. for 4 x 100W; 2 x 200W; 1 x 400W)

- mains supply voltage
  - at rated output power -3 dB : 1200 VA
  - at rated output power -8 dB (Vu=0) : 500 VA
  - no audio signal : 55 VA
- battery supply 48 V DC
  - at rated output power -3 dB : 10 A
  - at rated output power -8 dB (Vu=0) : 5 A
  - no audio signal : 0.6 A

Ready for operation

- after switch-on : max. 4 seconds

INPUTS

Audio input ('music') : balanced

- sensitivity : 0.5 - 10 V (adjustable)
- impedance : 10 kΩ

Priority input ('call') : balanced

- sensitivity : 1 V
- impedance : 10 kΩ

Surveillance input ('test') : balanced

- sensitivity : 500 mV (20 kHz) for rated output -20 dB
- impedance : 10 kΩ at 20 kHz

CHARACTERISTICS

Signal-to-noise ratio (flat weighted)

- minimum : > 87 dB
- typical : > 91 dB

Cross talk attenuation : > 70 dB at 5 kHz

Frequency response (-10 dB) ::50 to 20,000 Hz (-3 dB)

Distortion (THD) : < 0.5% at rated power at 1 kHz)

Interference (council directive 89/336 EEC)

- radiation : according to EN 55013
- immunity : according to EN 55020

Power bandwidth (-3 dB) : 50 to 20,000 Hz (THD = 2%)

OUTPUT

Output protection

- The circuit is protected against any misloading, short circuit and oscillation on driving with any frequency.
- The amplifier can withstand (without any damage) switching-on and switching-off of the power modules while delivering full output power and in case neither an input nor an output has been connected.

Monitor output

- Headphone impedance : 8 - 600 Ω

VU-meter

- 100 V output : '0'-mark = 40 V ± 0.5 dB at 1 kHz (-8 dB)

Rated output power

per amplifier channel (per IEC 268-3)	minimum load impedance		
	100 W	200 W	400 W
100 V output	100 Ω / 50 nF	50 Ω / 100 nF	25 Ω / 200 nF
70 V output	50 Ω / 100 nF	25 Ω / 200 nF	12.5 Ω / 400 nF
50 V output	25 Ω / 200 nF	12.5 Ω / 400 nF	6 Ω / 800 nF

SAFETY : according to IEC 65 and BS 415

ENVIRONMENTAL CONDITIONS

- operating temperature : -10 to 55°C
- storage temperature : -40 to +70°C
- relative humidity : <95%

DIMENSIONS (H x W x D) : 133 x 480 x 310 mm (3HE 19"-rack height)

TYPE CONFIGURATION AND WEIGHT

	configuration			weight (unpacked approx. kg)
	100 W	200 W	400 W	
LBB 1342/40	1 x			11.5
LBB 1343/40	2 x			12.7
LBB 1344/40		1 x		11.6
LBB 1346/40	4 x			19.3
LBB 1347/40		2 x		18.6
LBB 1348/40			1 x	16.4

This product is manufactured to comply with the radio interference requirements of the Council Directive of 4th November 1987/308/EEC.

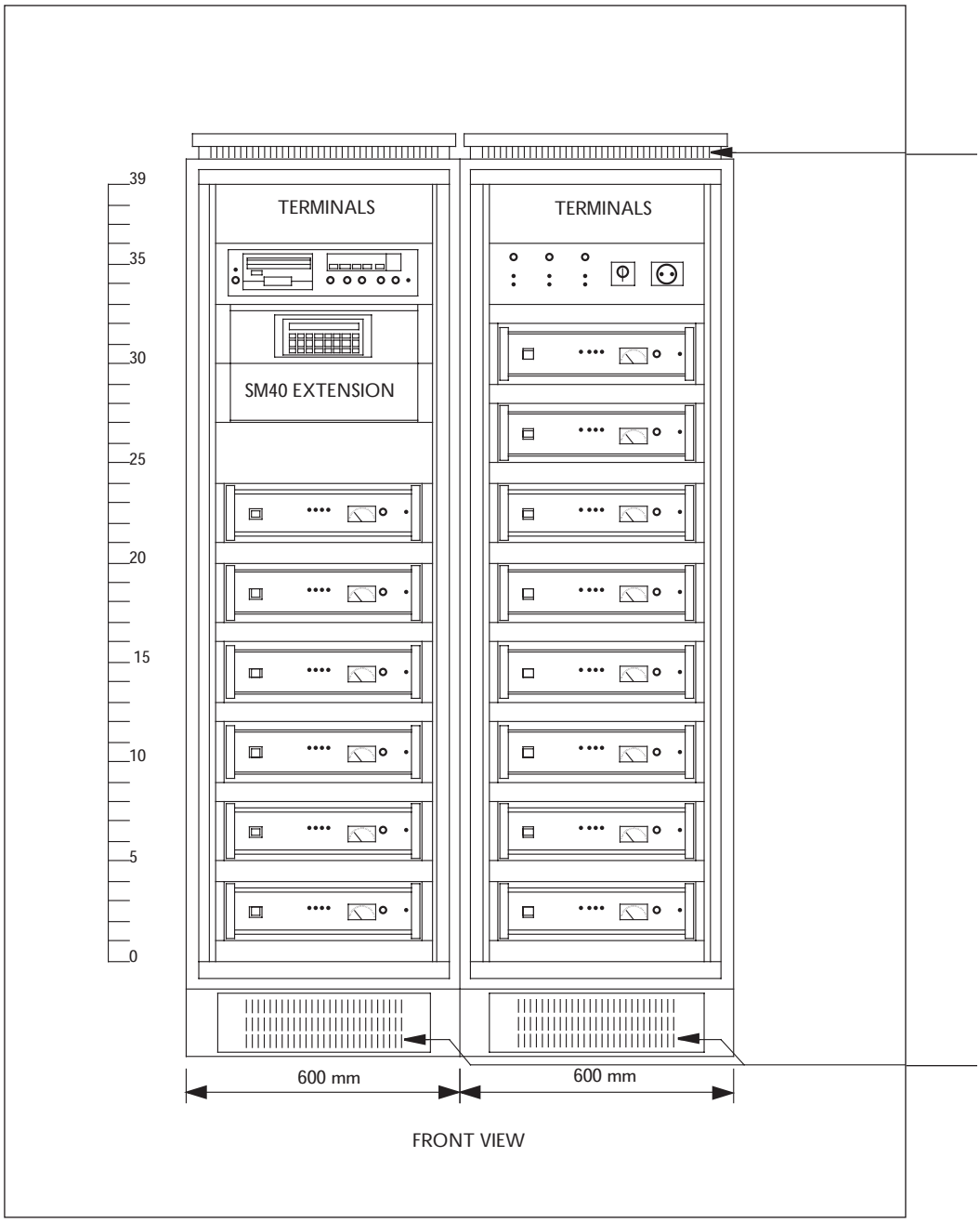
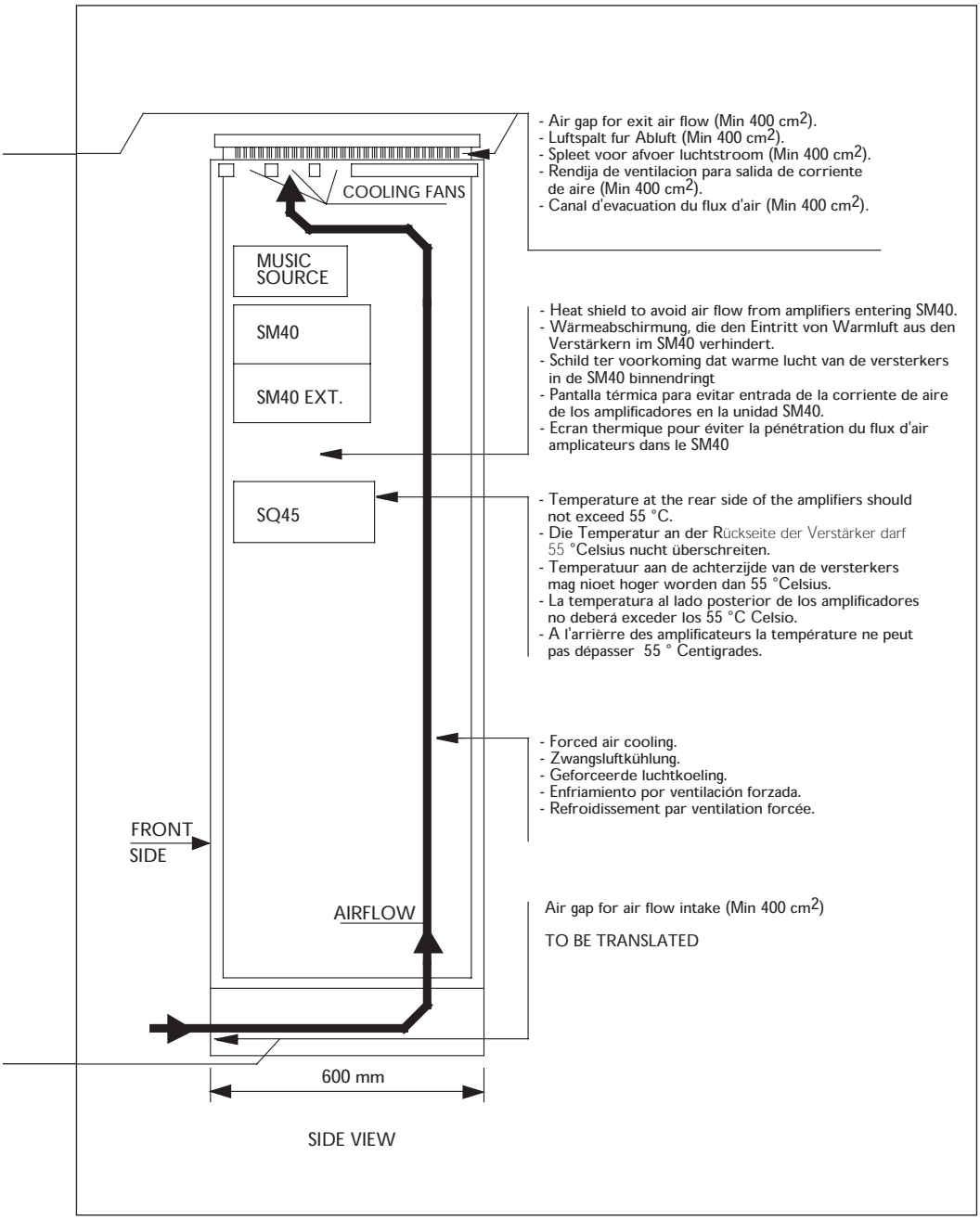


Fig.11 19" Rack mounting


- Air gap for exit air flow (Min 400 cm2).
- Luftspalt fur Abluft (Min 400 cm2).
- Spleet voor afvoer luchtstroom (Min 400 cm2).
- Rendija de ventilacion para salida de corriente de aire (Min 400 cm2).
- Canal d'evacuation du flux d'air (Min 400 cm2).
COOLING FANS
MUSIC SOURCE
SM40
SM40 EXT.
- Heat shield to avoid air flow from amplifiers entering SM40.
- Wärmeabschirmung, die den Eintritt von Warmluft aus den Verstärkern im SM40 verhindert.
- Schild ter voorkoming dat warme lucht van de versterkers in de SM40 binnendringt
- Pantalla térmica para evitar entrada de la corriente de aire de los amplificadores en la unidad SM40.
- Ecran thermique pour éviter la pénétration du flux d'air amplicateurs dans le SM40
SQ45
- Temperature at the rear side of the amplifiers should not exceed 55 °C.
- Die Temperatur an der Rückseite der Verstärker darf 55 °Celsius nucht überschreiten.
- Temperatuur aan de achterzijde van de versterkers mag nioet hoger worden dan 55 °Celsius.
- La temperatura al lado posterior de los amplificadores no deberá exceder los 55 °C Celsio.
- A l'arrièrre des amplificateurs la température ne peut pas dépasser 55 ° Centigrades.
- Forced air cooling.
- Zwangsluftkühlung.
- Geforceerde luchtkoeling.
- Enfriamiento por ventilación forzada.
- Refroidissement par ventilation forcée.
FRONT
SIDE
AIRFLOW
Air gap for air flow intake (Min 400 cm2)
TO BE TRANSLATED
600 mm
SIDE VIEW

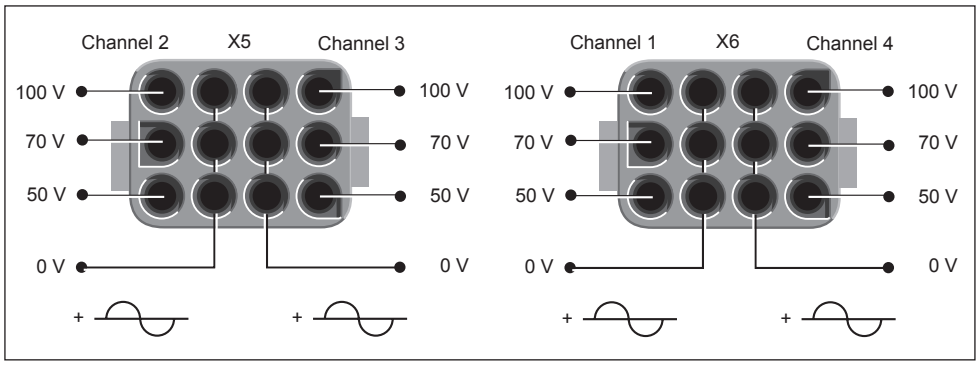


Fig.7 Loudspeaker connections

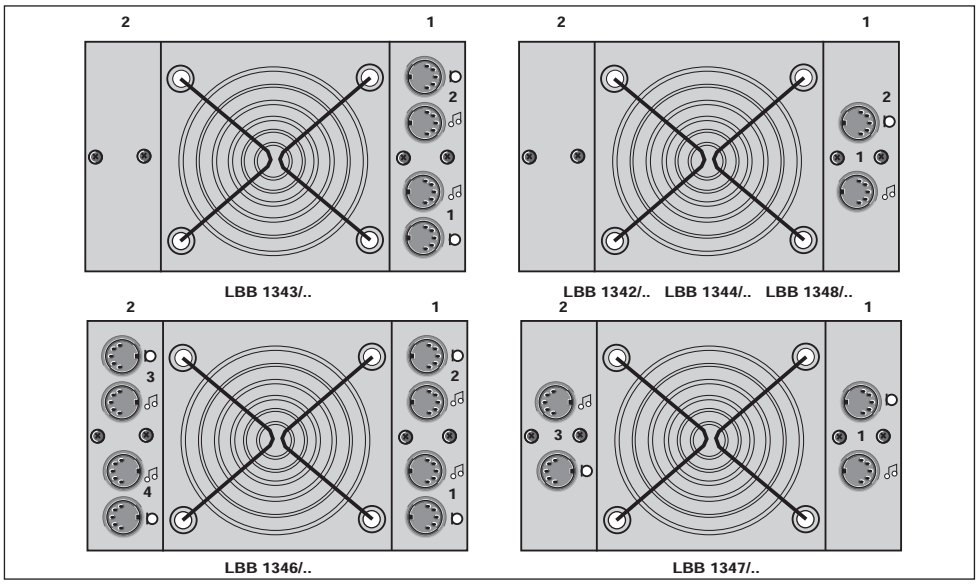


Fig.8 Configuration types

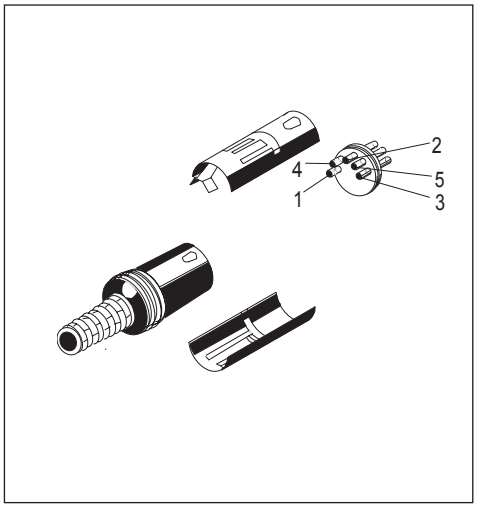


Fig.9 DIN-plug 180°

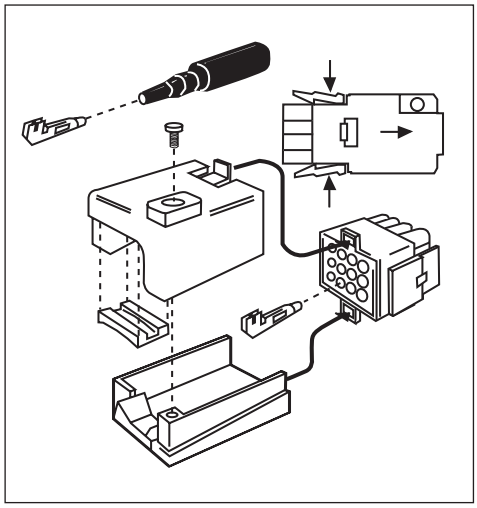


Fig.10 Mate-N-Lok connector

3922 988 33394 94-08
All specifications subject to modification without notice